UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,841	05/15/2006	Warren Thomas Johnson	2003P87067WOUS	7643

28524 7590 12/09/2009

SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
170 WOOD AVENUE SOUTH
ISELIN, NJ 08830

EXAMINER	
ANDERSON, DENISE R	
ART UNIT	**PAPER NUMBER**
1797	

MAIL DATE	DELIVERY MODE
12/09/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/595,841	JOHNSON, WARREN THOMAS	
	Examiner	Art Unit	
	Denise R. Anderson	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 November 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) *23-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-33* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 6, 2009 has been entered.

Claim Rejections - 35 USC § 102

3. Claims 1-12, 14, and 17-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Cote el. (US Patent No. 5,607,593, Mar. 4, 1997).

4. Regarding claim 1, Cote et al. discloses aeration / backwash devices in a water-treatment installation with one or more membranes (membranes 3) vertically spaced between upper and lower headers. Cote et al., Abstract, line 1; Figs. 1, 3, 5-8 and 10 showing membranes 3. There are two types of Cote et al. aeration / backwash devices. First, there is a wall 9 through which air from the air compressor 19 or permeate from backwashing pump 18, or both, are delivered from permeate recovery chamber 10 into the membrane modules 3 via the openings in the hollow fibers housed in sheaths 5. Cote et al., Figs. 1, 7, and 8; col. 10, lines 1-19. In this case, applicant's aeration / backwash devices would be the Cote et al. hollow fibers with the recited

communication chamber being the hollow center of the hollow fibers and the recited through-openings that gas and liquid pass through being the hollow fiber pores.

5. The one remaining claim 1 limitation is taught by the second type of Cote et al. aeration / backwash device. Cote et al. discloses such devices in Figs. 1, 2 and 5-11 as ozone (or O3) injection means 6 connected to an ozone supply network 15 "to serve as both a circulation fluid and an oxidizing fluid." Cote et al., col. 3, lines 27-28. Cote et al. further teaches, "The ozone could therefore be introduced into the installation according to the following three modes of implementation: in a gaseous monophase form . . . in a biphase form . . . in an aqueous monophase form." Cote et al., col. 4, lines 33-44; Fig. 1 where the ozone is introduced as a gas, Fig. 7 where the ozone is introduced as a gas with water, and Fig. 8 where the ozone is introduced in saturated water form. Cote et al. further discloses three embodiments of the ozone injection means that correspond to the recited aeration/backwash device with a communication chamber and spaced through-openings for the introduction of gas or liquid. First, there is the tube shown in Fig. 6 where the ozone (O3) is introduced by ozone injection means 6. Second, there is the annular structure shown in Fig. 9 at the bottom of the membrane module 31 where the chamber is underneath the hood, with the small through-openings shown at the ends of the ozone supply means 15 and the large through-openings shown as lower open-worked zone 8. Third, there is porous structure 16 through which ozone (O3) is introduced as shown in Fig. 10. The second embodiment shown in Fig. 9 is an example of applicant's recited "aeration/backwash device [that] is adapted to at least partially surround a portion of said membrane module" and "gas is supplied . . . through said through-openings in a direction substantially perpendicular to a longitudinal axis of said membranes to provide cross flow gas distribution for aerating the

membranes." Cote et al. discloses small through-openings shown at the ends of the ozone supply means 15 and the large through-openings shown as lower open-worked zone 8. Cote et al., Fig. 9. Referring to Figs. 9, 9a, and 9b, Cote et al. further teaches that the gas is supplied through the small through-openings "by pipes positioned essentially perpendicularly to the longitudinal axis of the modules (applicant's membrane modules)." This meets the limitation that gas is supplied "through said through-openings in a direction substantially perpendicular to the longitudinal axis of said membranes to provide cross flow gas distribution for aerating the membranes."

6. In summary, Cote et al. anticipates all claim 1 limitations.

7. As an aside, it does not enter into the patentability analysis whether the liquid backwash provided to the aeration / backwash device is permeate or water to be treated because it has been held that, "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). MPEP 2115 [R-2]. As long as Cotes et al. discloses an apparatus structure to deliver a gas or a liquid through the through-openings of the aeration/ backwash device, the prior art reads on the claim limitation. In this case, Cotes et al. discloses that both gas and liquid can be delivered to the through-openings in the hollow fiber aeration / backwash device and the ozone injection aeration / backwash devices.

8. Regarding claim 2, Cote et al. discloses an aeration/backwash device wherein the gas and liquid backwash are selectively communicated through the same through- openings. In other words, gas and liquid can be introduced "selectively" in time where gas is introduced first and

then liquid or vice versa. For hollow fiber aeration / backwash devices, Cote et al. teaches, "The backwashing . . . starts with the permeate present in the chamber 10 . . . and ends by the penetration of air . . . at the end of the backwashing operation." Cote et al., col. 10, lines 9-26; Figs. 1, 7, and 8. For the ozone injection aeration / backwash devices, Cote et al. shows equipment set up to deliver a gas stream through ozone-supply means 22 and an air compressor 19 and liquid through pump 21a in Figs. 7 and 8, such that gas and liquid can be introduced selectively to ozone injection means 6.

9. Regarding claims 3 and 4, claim 3 recites the through-openings are vertically spaced and gas moves "through at least the upper of said through-openings" and liquid "is withdrawn . . . through the lower of said through-openings." Claim 4 recites liquid is fed "into the base of the module through the lower openings or both sets of openings." As was discussed in the claim 1 patentability analysis, Cote et al. discloses the apparatus in place to deliver gas and liquid to the hollow fiber aeration / backwash devices (Figs. 1, 7, and 8) and the ozone injection aeration / backwash devices in (Figs. 7 and 8). Cote et al. further teaches that the hollow fiber aeration / backwash devices have vertically spaced through-openings in the form of pores such that gas moves "through at least the upper of said through-openings" and liquid "is withdrawn . . . through the lower of the through-openings," as recited in claim 3. Cote et al. further teaches, in Figs. 1, 7, and 8, that liquid is fed "into the base of the module through the lower openings or both sets of openings" as recited in claim 4. Cote et al. also discloses vertically spaced through openings in the ozone-injection aeration / backwash device shown in Fig. 9 with small through-holes shown at the ends of the ozone supply means 15 and the large through-holes shown as lower open-worked zones. In Fig. 9, Cote et al. further teaches bubbles 11 and liquid moving

"through at least the upper of said through-openings." As was discussed in the claim 1 patentability analysis, Cote et al. also teaches that ozone can be injected as a liquid (Fig. 8 and col. 4, lines 33-34 and 42) through the ozone network supply means 15 shown in Fig. 9. As such, Cote et al. discloses that liquid is fed "into the base of the module through the lower openings or both sets of openings" as recited in claim 4.

10. Regarding claim 5, Cote et al. discloses an apparatus in place such that "ozone injection means (applicant's aeration / backwash device) enabl[es] the creation of a current of water within said sheath" and thus discloses a device that can inject liquid "to sweep solids along membranes . . . during aeration" as recited.

11. Regarding claims 6-10, Cote et al. discloses an ozone injection aeration / backwash device in Fig. 9 at the bottom of the membrane module 31 and also hollow fiber aeration / backwash devices (fibers enclosed in membrane module 31) with the through-openings being the hollow fiber pores. Both types of devices were discussed in the claim 1 patentability analysis above. As was also discussed in the claim 1 patentability analysis, Cote et al. further teaches that both gas and liquid flow through these devices in Figs. 1, 7, and 8. The Cote et al. ozone injection device in Fig. 9 has small through-holes shown at the ends of the ozone supply means 15 and large through holes shown as lower open-worked zone 8. As such, Cote et al. discloses upper and lower through-openings [claim 6] through which liquid flows [claim 9]. The upper through-openings, i.e., the pores, of the hollow fiber devices are smaller than the lower through-openings of the ozone injection device [claim 7]. Cote et al. also discloses, in the Fig. 9 ozone injection device, through-openings axially displaced around the periphery of the chamber [claim 8] in the form of an annulus [claim 10].

12. To summarize, Cote et al. anticipates all limitations recited in claims 2-10.

13. Independent claim 11 recites claim 1 limitations in a different format. As such, the patentability analyses are analogous. Claim 11 further recites an upper and lower filtrate collection chamber. Cotes et al. discloses an upper filtrate chamber in Figs. 10 and 11 and a lower filtrate collection chamber (permeate-recovery chamber 10) in Figs. 1 and 6-8.

14. To summarize, Cote et al. anticipates claim 11.

15. Dependent claim 12 recites claim 3 limitations and, as such, the patentability analyses are analogous. To summarize Cote et al. anticipates claim 12.

16. Dependent claim 14 recites that the aeration / backwash device is adjacent the lower header. Cote et al. discloses this for the hollow fiber aeration / backwash devices (membranes 3) in Figs. 5, 6, and 9-11. Cote et al. further teaches this for the ozone injection aeration / backwash devices shown in Fig. 6 (the tube where the ozone, O3, is introduced by ozone injection means 6), in Fig. 9 (the annular structure at the bottom of the membrane module 31 where the ozone, O3, is introduced through ozone supply means 15) and Fig. 10 (the porous structure 16 where ozone, O3, is introduced).

17. Dependent claims 17-22 recite various limitations on a screen surrounding the membranes. In Figs. 1-11, Cote et al. discloses a screen (sheath 5) at least partially surrounding the membranes [claim 17] (membranes 3) and at least partially extending along the membrane length [claim 18] in a membrane filtration module (filtration module 31). The Cote et al. screen (sheath 5) is solid [claim 19] and located above the ozone injection backwash / aeration devices

[claim 20] as shown in Fig. 6 (the tube where the ozone, O3, is introduced by ozone injection means 6), in Fig. 9 (the annular structure at the bottom of the membrane module 31 where the ozone, O3, is introduced through ozone supply means 15) and in Fig. 10 (the porous structure 16 where ozone, O3, is introduced). In these same figures, Cote et al. further teaches that the screen (sheath 5) extends the full length of the membrane module (membranes 3 in filtration module 31) with one or more openings (open-worked zones 8) adjacent the aeration / backwash device and additional openings (open-worked zones 8) at the top [claim 21]. Cote et al. also teaches that liquid moves through the screen openings [claim 22], i.e. the sheath holes, when Cote et al. discloses that "said sheaths hav[e] holes that enable the passage of water to be treated in said preferred direction of treatment." Cote et al., col. 3, lines 60-62.

18. To summarize, Cote et al. anticipates all limitations recited in dependent claims 12, 14, and 17-22.

Claim Rejections - 35 USC § 103

19. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cote el. (US Patent No. 5,607,593, Mar. 4, 1997) as applied to claim 11 above, and further in view of Zha et al., (WO 03/013706 A1, Feb. 20, 2003 – which will be cited from the equivalent US Patent Pub. 2004/0217053 A1).

20. Claim 13 recites a filtrate collection pipe between the upper and lower filtrate collection chambers. Cote et al. discloses the claimed invention except for the filtrate collection pipe. In the Fig. 1 membrane module assembly, Zha et al. teaches that it is known to have a filtrate collection pipe between upper and lower filtrate collection chambers (permeate collection

headers 9 and 10). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have included a filtrate collection pipe between the Cote et al. upper and lower filtrate collection chambers as taught by Zha et al., since Zha et al. states at ¶ 30, lines 8-10, that such a modification would allow "[f]iltrate / permeate [to be] removed from both ends of the module 6 through ports 11 and 12 connected to headers 9 and 10 respectively," as opposed to just one end.

21. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cote el. (US Patent No. 5,607,593, Mar. 4, 1997) as applied to claim 11 above, in further view of Watanabe et al. (WO 02/04101 A1, Jan. 17, 2002 – which will be cited from the equivalent US Patent Pub. 2004/0045893 A1).

22. Cote et al. discloses the claimed invention except for explicitly stating that the filtration module is detachable [claim 15] from the upper and lower collection chambers. Watanabe et al. teaches that the filtration module is detachable in Figs. 1, 4, 6 and 9-11 for "a hollow fiber membrane cartridge used in a filtration apparatus used for removing turbidity and bacteria from a large volume of raw water." Watanabe et al., ¶ 1, lines 6-8. Referring to Fig. 6, Watanabe et al. further teaches, "The hollow fiber membrane cartridge of the present invention is inserted into the housing from above and fixed to the upper end of the housing head by means of the collar 12a of the cartridge through a gasket or an O-ring so as not to permit the passage of liquid either in or out. . . . The housing head 21b, the collar 12a and the cap 24 are integrally fixed by means of a housing nut 23." Watanabe et al., ¶ 98. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have constructed the Cote et al. filtration module to be detachable as taught by Watanabe et al., since Watanabe et al. states at ¶ 98 that

such a modification would allow the hollow fiber membrane cartridge to be inserted into the housing (applicant's screen) and then detachably secured there by a fitting so that the liquid to be filtered would not bypass the membranes.

23. Cote et al., in view of Watanabe et al., discloses the claimed invention except for the bayonet-type fitting recited in claim 16. The Watanabe et al. fitting is shown in Figure 9 as a clamp 20 and in Figures 10-11 as a threaded housing nut 23. It would have been obvious to one having ordinary skill in the art at the time the invention was made, in the Cote et al. filtration module, to have substituted a bayonet-type fitting for the clamp or threaded housing nut taught by Watanabe et al. because of the equivalence for their use in the fittings art – and the selection of any of these known equivalents to allow the hollow fiber membrane cartridge to first be inserted into the housing (applicant's screen) and then detachably secured there by a fitting so that the liquid to be filtered does not bypass the membranes, would be within the level of ordinary skill in the art.

Response to Arguments

24. Applicant's arguments filed February 17, 2009 have been fully considered but they are not persuasive.

25. Applicant's arguments are directed to the newly recited limitation that "gas is supplied to the chamber and communicated through said through openings to in a direction substantially perpendicular to a longitudinal axis of said membranes to provide a cross flow gas distribution for aerating the membranes."

26. Regarding claim 1, applicant argues, "This is in contrast to the arrangement shown in Cote et al. Cote et al. shows distribution network 15 having a pair of upstanding pipes which are spaced apart from the filtration modules 31 and a hood arrangement (see Fig. 9). It can clearly be seen that the upstanding pipes in Cote et al. **are oriented in a position parallel to the fiber bundles**." Applicant's Remarks, p. 9, lines 21-24. Applicant makes a similar argument regarding claim 11. Applicant argues, "By contrast, Cote et al. does not disclose or suggest through-openings that are arranged around the module circumference. Rather, Cote et al. shows a distribution network 15 having a pair of **upstanding pipes which are oriented in a position parallel to and spaced apart from** the filtration modules 31 and a hood arrangement (see Fig. 9)." Applicant's Remarks, p. 10, lines 22-25.

27. The limitation under discussion follows.

> *gas is supplied to the chamber and communicated to the membrane module through said through-openings in a direction substantially perpendicular to a longitudinal axis of said membranes to provide cross flow gas distribution for aerating the membranes within the membrane module*

28. Applicant argues that the Cote et al. Fig. 9 embodiment shows the gas introduced to the chamber with upstanding pipes. The examiner responds as in the above patentability analysis. Cote et al. discloses several embodiments of the claimed aeration / backwash devices, some of which were discussed in the claim 1 patentability analysis. The Cote et al. embodiment shown in Fig. 9 is an example of applicant's recited "aeration/backwash device [that] is adapted to at least partially surround a portion of said membrane module" and "gas is supplied . . . through said through-openings in a direction substantially perpendicular to a longitudinal axis of said

membranes to provide cross flow gas distribution for aerating the membranes." In Fig. 9, Cote et al. discloses small through-openings shown at the ends of the ozone supply means 15 and the large through-openings shown as lower open-worked zone 8. Referring to Figs. 9, 9a, and 9b, Cote et al. further teaches that the gas is supplied through the small through-openings "by pipes positioned essentially perpendicularly to the longitudinal axis of the modules (applicant's membrane modules)." This meets the limitation that gas is supplied "through said through-openings in a direction substantially perpendicular to the longitudinal axis of said membranes to provide cross flow gas distribution for aerating the membranes."

29. Applicant also appears to be arguing that Cote et al. does not disclose a "chamber" in Fig. 9 because it is a "hood." The examiner maintains that the gas is introduced into the recited chamber in Cote et al.'s Fig. 9. In the alternative, Cote et al. also discloses chambers in Figs. 10 and 11 which are above the porous structure 16 through which ozone (O3) or gas is introduced and below the lower header into which the membranes 3 are potted.

Conclusion

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise R. Anderson whose telephone number is (571)270-3166. The examiner can normally be reached on Monday through Thursday, from 8:00 am to 6:00 pm.

31. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter D. Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

32. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DRA

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797